

## DMJ casebook series

## Body on the beach... a case of foot and mouth?

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**Abstract**

The case of a missing person is described whose body was discovered almost 8 months later on a secluded beach on the Solway coast, south west Scotland. The delay in discovery was due to the foot and mouth outbreak in the UK in 2001 and this resulted in conditions favouring the development of partial mummification. The influence of the tides and involvement of HM Coastguard are discussed, along with difficulties in the identification of partially skeletonised remains.

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**1. Introduction**

The Solway coast in Dumfries and Galloway is renowned for its rugged coastline and secluded beaches. The following case was that of a missing person who disappeared over Christmas 2000 and was then discovered, partially skeletonised, in August 2001 on a local beach. The 7 month period during which the person was missing coincided with the outbreak of foot and mouth disease in the region, which was likely responsible for the delay in finding the body. The case was particularly interesting due to these circumstances and also due to the fact that this was the first time that I had some involvement with the coastguard. I intend to outline the case and the circumstances leading to the discovery of the body, discuss the coastguard's involvement and finally discuss the difficulties associated with positive identification of the body.

**2. The Case**

In August 2001 I was called to attend a small secluded beach where some local children had discovered a body.

The beach was about 10 miles west of Dumfries and access to the beach was difficult due to overgrowth along the normally clear farm track that had been closed for the previous 4 months due to foot and mouth disease. The coastguard had also been informed and was in attendance since the body was on shore. The scene had been secured by the police and required lighting by a farmer's tractor. The beach was pebbled and the tide was out. The body was lying supine (Fig. 1) slightly sunk into the beach, parallel to the coastline and in alignment with an obvious high tide mark (created by debris/seaweed). The body was still partially clothed wearing Next pinstripe trousers, a Next shirt wrapped around one arm, shoes, socks and a Ben Sherman buckled belt. The legs were skeletonised but the torso, some of the arm and most of the face interestingly showed signs of mummification (Figs. 2 and 3). A lot of the neck, fingers and some abdominal contents showed evidence of animal predation (Fig. 4). No rings or chains were present. There was nothing to suggest any suspicious features on external examination. It soon became clear that the body was that of a young male who fitted the description of a missing person who had disappeared around Christmas 2000. The person concerned had phoned his parents in a distressed state and had threatened to throw himself into the local river Nith that passed through Dumfries. He had been out with friends that night, consumed a lot of alcohol

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Fig. 1. Body lying in parallel with coast line and a tide mark.

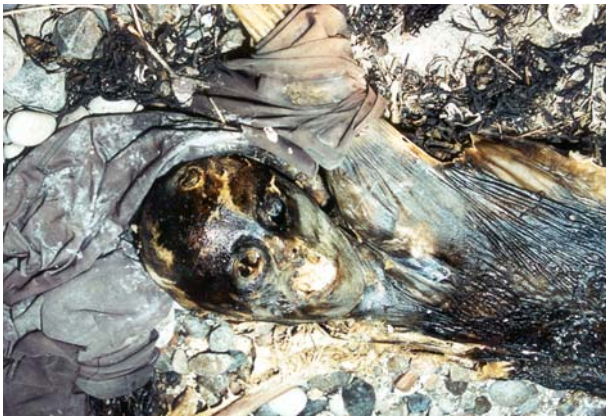


Fig. 2. Signs of mummification seen on face and upper torso.



Fig. 3. Signs of mummification on face.

and had become upset and distressed regarding some personal circumstances. He had not been seen since.

Since there were no suspicious circumstances evident, the body was removed in a body bag with the help of part time coastguards, and transported back to the main road on the back of a tractor. The post mortem did not reveal anything suspicious. However the pathological findings of some mummification were particularly interesting, since it



Fig. 4. Evidence of predators chewing fingers and thumb.

is unusual to find atmospheric conditions in the UK which cause this (warm and dry). The usual scenario described in which mummification can occur is where an unwanted newborn baby is either stillborn or dies and is immediately hidden in a dry place, such as an attic or airing cupboard. Since the newborn are virtually “sterile” at birth, if put in a dry place then moist putrefaction may be avoided.<sup>1</sup> In this case, mummification had occurred mainly in the exposed parts of the body and presumably the constant sea breeze along with relatively mild weather conditions had dried out these parts, once the body had been deposited on the beach. The skin over the face was particularly tough and leathery, but well preserved. The body had presumably been in cold sea water since the winter which would have delayed decomposition and putrefaction, and possibly led to a degree of adipocere formation. Then at some point it would have been deposited on the beach where putrefaction would have accelerated, although as mentioned earlier, the drying action of the constant sea breeze contributed to the formation of “mummified” tissues in some exposed parts.

A local dentist with an interest in forensics was also present at the postmortem to record the dentition of the deceased. No fingerprinting was possible mainly due to the drying out of the skin in this area and also several of the fingers had been chewed at by animal predators. Samples of remaining tissue (liver/bone) were sent for DNA analysis.

### 3. Foot and mouth disease

The first outbreak of foot and mouth disease in Scotland was confirmed on 1st March 2001 at a farm near Lockerbie, close to Dumfries. In Scotland access to public paths was simply restricted based on a risk assessment made by the landowners at their own discretion (in England there was a complete ban on walks on land and pathways). Access to the beach concerned was restricted from early March onwards and these restrictions remained in force until late July when they were then lifted. This created an ideal situation for the body to remain undiscovered and

“dry out” after being in the water. Under normal circumstances dog walkers or fishermen would probably have discovered the body, but instead it lay undiscovered for about 3 more months enabling continued decomposition to occur along with conditions favouring some mummification, all as a result of the foot and mouth crisis.

#### 4. HM Coastguard<sup>2</sup>

The local coastguard covers an area including the Solway coast and the Irish sea. He is the only full time employee in this area but also has a group of “on call” volunteers that support him. Routine work involves regular monthly patrols of beaches to maintain designated rescue areas as well as public accesses, both by boat and by land. This did not occur during the foot and mouth crisis.

During an emergency, either coastal or offshore, the coastguard is automatically called. Depending on the incident and circumstances a “coastguard unit” is despatched, which may then be supported by rescue helicopter or lifeboat. If an injury has occurred, then ambulance control become involved and if there is a death, then the police are automatically informed. If the coastguard unit is first at the scene of a death, then they routinely secure and protect the area before the police arrive. Problems can occur however with an ever changing potential crime scene caused by the tide. If there is concern that the tide may wash away the body before the police arrive, then the coastguard liaises with the police before making safe the body. Our local coastguard always takes photographs of the scene before doing this, which is very helpful. Sometimes only the police are initially involved at a scene but if they have difficulties in retrieving the body from a coastal area or they have any queries regarding the tides or the likely “source” of a body, then the coastguard can be a very useful resource of information.

#### 5. Tides<sup>3</sup>

Tides are caused by the gravitational force of the moon and sun. The sea is pulled “out” towards the sun or moon, with the actual bulge of water occurring on the side of the planet exposed to this gravitational force, and also on the opposite side of the planet. The earth spins round relative to the moon in 24 h and 50 min, the so called lunar day during which any point on the earth experiences two high tides and two low tides. Consequently to fit in our 24 h solar day, the tide time alters by 50 min per day at any given spot. The reason there is a difference in the heights of the tides, ranging from a small difference between high and low tide (known as neap tides), and a very much larger difference (known as spring tides), is because of the variation in the alignment of the sun and moon. If they are directly in line with the earth (full moon), the gravitational pull is maximised creating a higher high tide and lower low tide, i.e., a spring tide (twice per month). When the sun and the moon are not in line, then the tidal range is less. The

neap tides occur when the moon and the sun are at right angles to one another (first quarter and third quarter moons). As the moon orbits the earth over a 28 day period, there is a 28 day cycle of spring and neap tides, which are most pronounced at the equinoxes in March and September. Because of this rhythmic cycle, the tides can be predicted with accuracy many years ahead. Local conditions can vary this timing (20–30 min either way) and also the height of the tide (the so called “surge” which can lead to unpredictable flooding).

Locally the tide times are based on the nearest major port (Liverpool), with some fine tuning based on the distance we are away from this port. When the body was found, one question posed by the police was an estimation of how long the body had been on the beach, although in this case the body had also been in the water for an unknown period. The body lay in line with an obvious tidal mark high up on the beach. The coastguard from his experience knew that this specific tidal mark had been left by a particularly high tide. In actual fact within minutes he estimated that the body had been deposited at this location sometime between the 8th and 11th of April 2001, this being the last exceptionally high tide. This coincided with the probable timescale taken for signs of mummification to have occurred after deposition on the beach, which was just about 4 months. Subsequently the coastguard was able to show the likely course the body travelled, using local charts and maps, after falling in the river up stream within the town centre and eventually making its way down the estuary, probably getting held up on mudflats/bushes, etc., on its way until another high tide released it to continue its journey to the final resting point. This sort of “back tracking” is frequently performed by the coastguard whenever a body or perhaps wreckage is found floating at sea, in an attempt to calculate the course it had taken and where it came from. With the knowledge of local undercurrents, tides and recent weather conditions this sort of information can be obtained with fairly good accuracy.

#### 6. The identification process<sup>1,4,5</sup>

Once a body has been discovered, the police then become responsible for the control of the remains as well as for their identification and ultimately for the release of them to the next of kin. This identification process involves comparing antemortem data with postmortem data. It is a process that should not be rushed despite pressures that may exist to do so, and the police must be certain of the identity before telling relatives.

There are several important reasons for this identification process, not just to confirm the “fact” of death for that particular individual. Various legal claims in relation to property, estate and debts may exist, proof of claims for life insurance may be necessary and finally administrative details for burial or cremation have to be organised. If a criminal case exists, then identification of the individual is fundamental to the investigative process.



## 7. Partially skeletonised remains

The case described above was not straightforward since the body was partially skeletonised. This meant that visual identification, normally by face recognition, colour of eyes, tattoos, hair colour etc was not possible. Since the body was not fully skeletonised, identifying general features such as sex, stature, race, approximate age and confirming the bones were indeed human was not an issue. Once the general features had been identified, the next stage was personal identification. Caution must be exercised when accepting identification evidence at face value. Evidence such as clothing and personal property is circumstantial and is of limited value. Personal documents such as wallets and diaries may be well preserved due to the compact nature of the papers in these items and jewellery may bare inscriptions. However all this type of evidence is *secondary* evidence and is all circumstantial. Individuals may swap jewellery, similar clothes can be worn and wallets/credit cards can be stolen. It all contributes to the identification process but must not be used as the sole form of identification. Even visual inspection of a recently deceased individual can be fraught with difficulties, since facial contours change postmortem and in such a stressful situation, a relative may rush the identification and indeed get it wrong. More important are the three *primary* forms of identification:

1. *Fingerprinting* – this should be done even if other methods are available since they are so unique to each individual. Even in cases of prolonged immersion where there is slippage of the dermis, prints may still be obtained and also in cases of fire when soft tissue is destroyed, techniques are still possible to retrieve impressions. Most people will not have a criminal record and so will not have their prints registered at the National Identification Bureau. However personal items can be retrieved to make comparisons if necessary. In the case described, the fingers were either not present due to animal feeding or just too dried out to get a decent print. However it was attempted.
2. *Dental* – the teeth are placed in a relatively protected site of the body and are resistant to extremes of heat and decay. The method of identification however depends on good antemortem recording and comparing this to postmortem data. In the UK, patients dental records, unlike medical records, do not follow the “patient” around and are entirely dependant on the quality of latest dental recording made – dentists do not need to record a full past dental history at first consultation which is so crucial to this type of identification. The British Dental Association are however trying to address this at the present time. Teeth and restorations are compared to previous records and X-rays may be useful if

antemortem films exist. This primary form of identification must ideally not be considered alone, but alongside other secondary evidence (although it is recognised as an acceptable form of primary evidence). In this case, dental records of the suspected person were poor and outdated, and there was evidence that new work had been done on the teeth that was not present on the antemortem records held. This made identification by dental records unreliable.

3. *DNA* – this is the most accurate. It is only possible however when close blood relatives are available to provide a sample to compare with the deceased. It is however usually the last resort since it can be upsetting for the family concerned to have samples taken. This was the method used in the case described. Despite the secondary evidence of quite specific clothing, as well as a missing person fitting the description, the case highlights the importance of completing the identification process properly and thoroughly before telling relatives. Once the process has finished, it is then important to consider returning personal items to the next of kin, however insignificant they may seem.

## 8. Conclusion

This case highlights well, how much the environment can influence a body's final resting place if tidal water is involved, and also influence when it is discovered. No one could have predicted the outbreak of foot and mouth when the deceased went missing, but this almost certainly delayed discovery of the body by nearly 4 months leading to a unique situation whereby the body was able to dry out and partially mummify. The predictability of the tides is one of the remarkable wonders of nature and can be used with reliability if ever needed in a forensic setting.

## Acknowledgement

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## References

1. Knight B. *Legal Aspects of Medical Practice*. Churchill Livingstone; 1992.
2. Wood T. HM Coastguard, Maritime and Coastguard Agency, Solway Sector Manager, personal communication; 2004.
3. Featherstone N, Lee-Elliott E. *Reeds Nautical Almanac*. Nautical Data Ltd.; 2004.
4. Vanezis P. Identification of skeletalised and non skeletalised remains. DFMS course lecture 01/02/2001.
5. Warren CP. Personal identification of human remains: an overview. *J Forensic Sci* 1978;23:345–88.